

2. Much of the short range land transportation in the Soviet Arctic consists of dog-sled teams and reindeer, the latter used for the more southern parts of the tundra. At the beginning of the 30's, however, power driven vehicles were introduced for year round transportation. Winter snows are not deep enough to stall these tractors and the thawed tundra, supported by a layer of fossil ice, is tough enough to give smooth traction. On the Taimyr Peninsula tractors have been used successfully to pull loads of ten and fifteen tons. During the first year of their operation 30 thousand tons of brown coal were transported from the mines of Keshchnikov to their base nearby. Automobile trucks of one-and-a-half ton capacity operating on tracks, so-called "vsedekhtody" (going everywhere), are also in use though not as practical as tractors. Because of thawing of snow the most difficult period of the year, from the point of view of land transportation, is 6 June - 1 July. The next period of similar difficulty is during August and the beginning of September when the maximum thawing of frozen ground (25 cm to 40 cm) makes the tundra too soft for easy transportation. But, difficulties are overcome, for almost everywhere and under all weather conditions, air transport is linking remote points to the more important centers.
3. The many expanded activities have resulted in a large influx of population. It is still true that cities and towns as understood by the western world are few and far between. But expansion is rapid. Small settlements are growing into towns and towns eventually become cities. The vast polar wilderness is rapidly contracting. Murmansk with its population of over 100 thousand, its well developed lines of transportation, and its diversified industry, including shipbuilding, is not only the most important center of the Soviet Arctic, it is the most important arctic city of the world. In 1932, Igarka on the Yenesei River was a small settlement of but a few huts. In 1943, it was a town of about 30 thousand, and an important center of the timber industry with many large sawmills, which shipped their products to world markets. Nearby Norilsk is a mining and industrial center for the production of coal, nickel and platinum. The bulk of its population consists of forced labor from its concentration camps with some 70 thousand to 100 thousand inhabitants. Dudinka, also on the Yenesei River, is a town of about 10 thousand including forced labor working at the port and on the Dudinka-Norilsk railroad. Another large contingent of forced labor is working in coal and graphite mines. Many other communities with populations over 1,000 have come into existence during the period of 1932-1943. Exploration and exploitation of the natural resources of the area, i.e., coal, oil, iron ore, apatite, nickel, copper, aluminum, molybdenum, tungsten, vanadium, gold, timber, furs, fish, etc., and development of new agricultural varieties suitable for tundra regions, have gone far towards establishing self sufficiency of the area under control of GUSMP.
4. Development of the northern economy is not only an objective by itself, but, also a means of meeting military requirements, chiefly coal and oil for naval and air bases. The strategic importance of the Northern Sea Route is readily apparent, for it is axiomatic that the "trade routes of peace are the supply lines of war." Not only is the Northeast Passage the shortest water route between Soviet ports of Europe and the Far East, but practically the entire distance borders its own friendly shores instead of hostile nations. This arctic frontier has also been better developed than other polar regions of the world. To any country unfamiliar with arctic know-how the Northeast Passage is practically impregnable, thus constituting the Soviets' least vulnerable frontier. Along this vital route with its chain of naval and air bases can be transported men, food and material with relative safety. It is true that the navigation season is short, probably not longer than 2 1/2 months for the entire length of the Northern Sea Route, but this deficiency can be compensated for by the pre-selected moment of attack. Eastward sailings along this route afford a longer navigation season because the Kara Sea opens earlier than the Chukotski Sea. From the point of view of defensive operations the USSR would have to consider the possibility of attack on the Kolyma River and Norilsk. These areas of concentration camps form a nucleus of discontent that might well be exploited by the enemy. From the point of view of offensive operations this polar region is equally important. The Taimyr Peninsula is the Soviets' springboard for any war with the US - the springboard for throwing airborne troops into Canada and Alaska. The Soviet government has enormous cadres of arctic pilots and parachutists well trained and conditioned for arctic operations east of the Bering Strait. Via the arctic routes, the world's most important industrial areas are readily accessible by plane. There is no sense in either subordinating GUSMP to the Navy or MVD, in liquidating it, or in reducing its sphere of activity. A change in control would at once focus attention on the military activities of the organization. Now, under the pretext of the importance of regional research and development, are hidden military preparations. Such camouflage is typical of the Soviet government.
5. The achievements here briefly enumerated are the results of bold but careful planning and execution. They are the results of the cooperative efforts of thousands of men and women trained in arctic skills. They are the results of coordinated, scientific, exploratory and economic activities of numerous scientific establishments reaching from the Academy of Sciences down to field stations. They are the achievements of the Main Administration of the Northern Sea Route.

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5. Scientific and research accomplishments comparable with those of the Main Administration of the Northern Sea Route mean a far flung and well functioning organization. They mean adequate financial support and top level endorsement. Actually, GUSMP occupies the position of a ministry and has the status and rights of the latter. Because of the keen personal interest of both Stalin and Molotov in the arctic, GUSMP enjoys a privileged position. Furthermore, the three most important and omnipotent political organizations of the USSR - the Politburo, the Council of Ministers and the Central Committee of the All-Union Communist Party together with its Central Control Commission are all vitally interested in arctic research and development, and spare neither money nor effort in order to achieve the desired results. The fact that Ivan Dmitrievich Papanin who headed GUSMP from 1938 to 31 Jul 46, was a member of the last three organizations mentioned gave assurance that requirements would get prompt and careful consideration. Approved projects were thus expedited with a minimum of red tape. The structural pattern of GUSMP is typical of any Ministry. (Recently a TECHNICAL SOVIET, a body of highly qualified scientists, i.e. doctors, professors, academicians, has been organized as an integral part of all ministries.)
7. It is interesting to note the division of responsibilities between the three deputies of the Main Administration of the Northern Sea Route. The First Deputy is chief of the political administration, an indispensable part of the Soviet system. He is necessarily a Communist and a member of the Communist Party of very high standing and position. He is concerned with enlightenment, propaganda and political affairs. He controls party organization and personnel and enjoys greater authority than the other deputies. He serves two masters, the chief of GUSMP and also the Minister of Internal Affairs. Through this connecting link via the many personnel sections throughout the organization and also directly without apparent channels MVD exercises control throughout all of GUSMP. Above is the ever-omniscient Central Control Commission which holds in its hand the fate of every citizen of the USSR - death, exile or award. The Ministry of Defense also advises the First Deputy on matters of common concern.
8. The Second Deputy is head of polar aviation, which is an integral part of the Soviet Air Force. He is responsible for planning, staffing, administering, construction, and servicing all air lines which crisscross the Soviet Arctic, together with the air bases that serve them. His is a military organization. Besides its primary function of defense and attack (so far potential) it performs a gigantic task of communication, transportation, exploration, and reconnaissance, thus contributing considerably towards arctic development. Note that the Ministry of Defense exercises advisory functions in relation to the Second Deputy. Planes are flown by military pilots who are becoming more and more adept in arctic flying - a valuable experience and asset in case of national emergency. These pilots have graduated from schools of the Air Force, many of them from the Military Aeronautical Engineering Academy imeni Zhukovskii. First they are sent for conditioning to the severe climatic conditions of the Arctic, then for special training in polar operations and maintenance. When this program has been completed they are assigned for polar duty.
9. Both land and sea planes are used. As a result of expert knowledge of the winterization of airplanes, of accumulated experience in flying under severe weather conditions, and of the supporting services from radio and meteorological stations, these pilots are now flying day and night, over the North Pole, under practically any conceivable types of weather. Round trips to the North Pole are made on routine schedules. Through their arctic aviation contributes considerably to arctic research. No money is spared in implementing these activities. Equipment and personnel are of the best available.
10. Ice reconnaissance and ice patrol help increase the shipping season of the Northern Sea Route. Data from all air, sea, and land organizations making hydrometeorological observations are summarized by the Arctic Scientific Research Institute in Leningrad. Here are made short and long range forecasts regarding the navigability of the entire route, as well as of limited sections. On the basis of these forecasts, the ice breaker service is organized and its area of responsibility defined. Through regional branches this service controls the movement of convoys in the area under its jurisdiction. Normally in one convoy there are five to six and a maximum of ten ships to one ice breaker. Prior to dispatch and throughout the time that the convoy is in arctic waters reconnaissance planes make meteorological observations, photograph ice conditions, locate ice-free channels, etc. Data recorded by these planes, by coastal stations and by expedition ships are coded and submitted to the leading ice breaker with instructions concerning the most favorable route to follow. While in convoy, ships are under the authority of the leading ice breaker. The largest ice breakers have a capacity of 10,000 tons while the ships, particularly those of the Kara Sea, have a tonnage up to 5,000-7,000 tons.

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11. Whereas the primary function of the various air bases scattered along the entire route is to service planes, a secondary function is to collect scientific data of interest to polar aviation. Such information is forwarded to the Arctic Scientific Research Institute where it is coordinated with similar data collected by polar stations under the jurisdiction of the Meteorological Section of the Polar Administration. How well the activities of the many agencies of GUSMP are integrated may be further illustrated by the fact that if a pilot on ice reconnaissance duty spots seal rookeries he will immediately report their location to the sealing fleet.
12. The Third Deputy is in charge of all scientific research concerned with exploration and development of the Arctic. He is rarely a Communist, or a member of the Communist Party. Under his direction are the general administration, finance, arctic supply, regional and marine administration. Responsibilities are further circumscribed and authority delegated and at lower levels include ports, ships, technical exploration, geographical locations and specific ports and field works. Also under his jurisdiction are the Mining Geological Administration, the Hydrographic Office, the Polar Administration in charge of stations and the Arctic Scientific Research Institute. Above exercising scientific advisory functions with respect to the last four organizations mentioned, are the Academy of Sciences, the Ministry of Geology, the Ministry of the Coal Industry, the Ministry of the Oil Industry, and the Main Administration of the Hydrometeorological Service (This service also enjoys the status and rights of a ministry). This service receives from the Arctic Scientific Research Institute all information obtained by expeditions, stations, etc, as well as daily bulletins from arctic hydrometeorological stations. Regional branches are located in Leningrad, Murmansk, Archangel, Krasnoyarsk, Vladivostok, etc. The only direct interest of the Academy in arctic research is in its own Permafrost Committee (Merklotnaya Komissiya) in Moscow, which has an organization similar to that of a research institute. This committee has its own permafrost stations located in many regional centers of Siberia, such as Yakutsk, Khabarovsk, etc, while all other permafrost stations are under the Mining-Geological Administration of the GUSMP. From 1935-43 the most important permafrost station of the latter was at Igarka. In Norilsk there is probably another permafrost station of growing importance.

Mining and Geological Administration

13. The Mining and Geological Administration is concerned with exploring and exploiting the natural resources of the Arctic - coal, oil, iron ore, etc, etc. Its First Deputy is chief engineer and has under his jurisdiction Scientific Research Section, Permafrost Stations, and Trusts. The Second Deputy is concerned with planning, financing, administration and personnel. He is a member of the Communist Party, with its attendant greater authority. The Mining-Geological Administration acts as consultant to the Arctic Scientific Research Institute, which in turn forwards to the administration all geological data obtained by its field workers, except that pertaining to general geology, geomorphology, and glaciology.
14. To get an idea of the working of GUSMP, it may be interesting to trace a recommendation through channels to final action. Suppose, for example, the head geologist of the Oil Section is convinced of the existence of oil in a certain location. His recommendations supported by scientific data will then go to the First Deputy of the Mining and Geological Administration. From him it goes to the Third Deputy of the Main Administration of the Northern Sea Route. If the project is approved it goes down through the Finance Administration to the Planning Section. This section makes its own estimate of equipment, supplies and personnel needed, and prepares a budget which goes back to the Finance Administration for approval. These decisions are made without consulting the expert who originated the project who is subsequently charged with full responsibility for its execution. Such arbitrary procedures are frequently the cause for confusion, increased costs and delays. In extreme cases the scientists who originated the plan may end up in a forced labor camp. Thus the planning section is probably the weakest link in the entire organization. Political expediency and considerations imposed by the party system inevitably result in bureaucratic inefficiency.
15. The Ministry of Geology acts as adviser to the Mining and Geological Administration. Connected to this ministry is a secret military section referred to as "Spets-geo", with branches in every regional administration, engaged in teaching and research in geological cartography, hydrology and in preparation of data for military purposes. Its detailed functions are: studies of sea-ice and river-ice properties, beds of rivers, their changeable currents and run-offs, as well as types and methods of construction dictated by local conditions. Hydro-geologists of "Spets-geo" are consulted on all military installations and are held responsible for their recommendations.

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16. In addition to the head of the Hydrographic Office, two deputies assist in its administration. The First Deputy is chief engineer and had under his direction the Hydrographic Section which is responsible for summer marine expeditions, the Hydrographic Institute and the Geodetic Section responsible for summer land expeditions.
17. All charts of the Arctic are made by the Hydrographic Office. By means of astronomical observations of stars the coast line has been accurately plotted. Detailed maps or charts of particular sections, such as naval and air bases, are made by surveying by use of plane table and triangulation. All maps and charts of rivers (except their mouths) are made on the basis of surveying by GUGMS. Pilot maps of the rivers are published by the Ministry of Inland Water Transport. Since 1936 most maps and many charts have been classified as secret.
18. During the summer months many scientific expeditions leave Murmansk and Vladivostok for arctic waters. River boats and other vessels also head for the Arctic carrying scientific parties for field work of various kinds. Personnel selected by the scientific leaders of these expeditions are carefully screened for political views by the Cadres Section of the Hydrographic Office. Both scientists and technicians are well trained for the work in their chosen fields. Their educational level is on a par with that of their colleagues who head research in geophysics conducted at polar stations. In fact, many have graduated from the same institutions. But, as elsewhere, non-party members have less authority than other personnel at the same level of responsibility. Both the State Oceanographic Institute in Moscow and the Arctic Scientific Research Institute in Leningrad advise the Hydrographic Office on scientific matters.
19. The Hydrographic Institute is located in Okhta, Leningrad. It is a teaching institute with high scientific standards. In addition to subjects characteristic of the curriculum of a naval academy, courses in all branches of geophysics, with special emphasis on hydrography, hydrometeorology, aerodynamics, and phases of oceanography including marine ice and marine biology are offered. Most of the scientists who expect to work in the Arctic are trained at this institute. High standards comparable to those of the Naval Hydrographic Academy are maintained. The course of training comprises five years. Both faculty and students are in uniform similar to that of the personnel of the Arctic Navy and have corresponding rank, thus suggesting a military organization.
20. While the main hydrometeorological centers are located in Moscow and Leningrad, the polar stations that collect the data are scattered along the entire Northern Sea Route and on islands of the Arctic Ocean. They are directly under the Meteorological Section of the Polar Administration. They range in importance from geophysical observatories with 25-30 people, assigned for continuous field service for two year periods, down to meteorological stations with four people: two meteorologists, one radio operator and one mechanic. In some instances one of the meteorologists may also serve as radio operator. Authority of the regional polar stations is limited to each of the six seas that bound the Soviet Arctic. Thus the center controlling the area of the Barents Sea is in Murmansk; that controlling the Kara Sea is in Dickson; that of the Laptev Sea is in Tiksi, that of the East Siberian Sea is in Ambarchik; that of the Chukotka Sea is on Mys Schmidt; and that of Bering Sea is on Providence Bay. The stations at Nordvik on Kozhnevnikov Bay, Preobrazheniya Island, those on Novaya Zemlya (Mys Zhelaniya, Russkaya Gavan', Malye Karmakuly, Belushiya Guba, Logoskii Shar); Nar'yanmar (Pechora R); Andersma; Mys Sterlegova, Ruskii Ostrov, (Kara Sea); Enkhta Prenchishcheva on the Taimyr Peninsula; Donskii Ostrov (Severnaya Zemlya); and farther east, Bol'shoi Ostrov, Ust'Yana, Ust'Ingirdirka, Mys Ambarchik, Mys Shelagskii, and Mys Deshnev are all of growing importance.

In addition there are numerous stations, which though of less economic and strategic importance, are nevertheless equally important scientifically, for they are essential components of a well developed meteorological network.

21. Among the most important individual stations are the following:

- (a) Murmansk Station is the largest geophysical base in the Soviet Arctic, and its jurisdiction extends east to the Lena River. Its staff included about 25 scientists. It is well equipped with the necessary geophysical instruments, most of which were received from Germany 1940-41.
- (b) Enkhta Tikhaya Station (Franz Joseph Land) had a staff of 25-30 persons in 1941. It performs the work of a geophysical observatory. Studies of the upper atmosphere are in progress the year round under all kinds of weather conditions. Seismic methods for study of the stratosphere were first applied here by Russian and German scientists.

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- (c) Rudolph Island Station (Frank Joseph Land) is the northernmost outpost of the Soviet Arctic. Though not as large as the station at Buhta Tikhaya, its functions are nevertheless very important. It studies all weather, and ice conditions which affect polar aviation. It is the last land station on the air-route to the North Pole. It has no airfield. Planes fitted with skis land on the ice. Ice-domes on Rudolph Island are used for landing, rather than the frozen sea.
- (d) Igarka Station (Yenisei River) enjoys a high reputation for its hydrometeorological work, especially for its study of permafrost. Though some data are published, most are kept secret.
- (e) Russkaya Gavan' Station (Novaya Zemlya) has a staff of 25-30 who work throughout the year on all problems of geophysics including the study of the upper air and stratosphere. In 1941, it was known that the stratosphere at this point was below 20 km.
- (f) Spitsbergen Station. Because of the strict security regulations little is known about this station. Coal is mined in moderate quantities.
- (g) Dickson Island Station is not only a large hydrometeorological station but is also an important sea and air base in the Siberian Arctic. Its active commercial port is a pivotal point for world sea traffic, via the Kara Sea, into the heart of Siberia. It is in direct wireless and radio communication with Leningrad and Moscow. Coal is supplied by local mines on the mainland opposite the island as well as from Dudinka and gasoline by the oil fields near Koshchevnikov Bay.
- (h) Chalyuska Station is strategically located on the shore of Vilkitaki Strait which is the most difficult point for sea navigation along the entire Northern Sea Route.
- (i) Demashnii Island Station west of Severnaya Zemlya is an observation post, which supplements the Chalyuska Station.
- (j) Koshchevnikov Bay Station is gaining in importance because of the discovery of oil and the production of gasoline in the immediate area. Coal from nearby mines is produced in sufficient quantity for local needs. Enough salt is obtained from regional domes to meet the requirements not only of the entire Soviet Arctic, of its fleet, of its air bases, or of its fisheries, but for the entire Far East. (Salt production is 150 thousand tons a year.) The naval and air base on Koshchevnikov Bay are growing in importance because of oil and coal production nearby. A port for exporting coal has been planned with piers to accommodate 100-150 ships during the navigable season. The large air base is located on Cape Koristy on the north shore of Koshchevnikov Bay. The naval base has a good harbor for anchoring because there is no hummocking of ice. Both bases and ships use local fuel-oil (including gasoline and Diesel oil) and coal. Because of favorable ground conditions (Caprock) the region is well suited for construction of military installations.
- (k) Wrangel Island Station because of its geographic and strategic location in the far eastern section, on the northern rim of the De Long Strait, is in a continuous state of expansion into one of the largest stations in the Siberian Arctic.
- (l) Providence Bay (Zaliv Provideniya) is the largest station on the eastern end of the Northern Sea Route. Its naval and air bases are considered to be of great strategic importance.

The stations listed above are built on land and are stationary. To extend the range of meteorological observations, a system of drifting automatic stations has been established. Equipment is assembled by planes which make landings on the ice floes at predetermined locations. Stations installed on drifting ice packs record and transmit meteorological data at preset intervals. The position of these stations is constantly determined by land radio stations and their courses charted.

Nearly all the great Siberian rivers discharge their waters into the Arctic Ocean. With their tributaries they form important arteries of traffic connecting the tundra, the taiga and industrial Siberia with the Northeast Passage. To improve the navigability of these rivers and to develop them into a well integrated system of inland waterways, which in turn will accelerate development of the arctic economy, numerous hydrological "posts" have been established along their courses. Some of these posts, as well as expeditions work throughout the entire year, some only in summer, others only in winter. They all make hydro-meteorological observations and measurements, while the most important are also engaged in hydrological research.

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24. The Soviet Arctic has been referred to as the "weather kitchen of the world", and consequently special attention is paid to studies of all hydrometeorological factors and sea conditions necessary for long and short range, weather forecasting and sea ice forecasting - both indispensable for the intense and comprehensive development of coastal navigation along the entire length of the Northern Sea Route. Research conducted at these stations include the following fields of geophysics and astrophysics: Hydrometeorology; meteorology of the upper layers of the atmosphere; studies of the Aurora Borealis; the stratosphere; the ionosphere; cosmic rays; sun radiations; terrestrial magnetism and its relation to the aurora borealis; cosmic rays and solar radiation; seismology; gravimetry; and oceanography in all its branches, including marine chemistry and microbiology. Special attention is paid to studies of all hydrometeorological factors and sea-ice conditions in their relation to long and short range forecasts of weather and navigability.

25. It must be emphasized that all stations and posts in the Soviet Arctic are under the jurisdiction of GUSMP. Independent scientific expeditions may, however, be attached temporarily to a suitable station for special research projects. Such expeditions use their own instruments, and the function of GUSMP is to provide transportation and living quarters. For instance, on invitation of the Physics Institute of Leningrad University the prominent nuclear physicists and academicians, Kapitsa, Ioffe, Shkbel'tsin and Abartunian (astrophysicist), conducted field work on cosmic rays at a polar station in Buzhta Tikhaya. Their work on the subject was totally independent of GUSMP and the Arctic Scientific Research Institute and was highly secret. [redacted] they were trying to obtain concentrated energy from cosmic rays.

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26. All polar stations are equipped and supplied through Arctic Supply according to their size, importance and functions. It is the responsibility of the Arctic Scientific Research Institute to staff them with scientists, technicians and labor. Scientific personnel come mostly from the Hydrographic Institute.

27. Soviet scientists try to secure and use the best instruments available, which are usually of foreign make. Instruments made in the USSR, particularly those for hydrographic purposes produced at the Olkita factory in Leningrad, are of inferior quality compared with those produced abroad. Precision instruments are definitely inferior. [redacted] 25X1

In developing equipment and instruments for use in the Arctic, the conditions (cold, dampness, snow, rain, permafrost, fossil-ice, frozen ground, etc) under which they are to be used are taken into careful consideration. Simple and ingenious devices, as well as means for their protection against severe cold, or changes of temperature, are developed on the spot. With the tools at hand together with imagination, perseverance and enthusiasm these scientists are able to achieve creditable results. Severe cold does not interrupt their work. Only blizzards and the requirement of eight hours of sleep limit their working day.

28. Some of the main polar stations are at the same time important military centers as are the Naval and Air Bases in Murmansk, Dickson, Keshchevnikov, Tikai and Provideniya.

29. The Arctic Scientific Research Institute is located in the former Scheremet'ev House, Fontanka Street 34, Leningrad. It conducts scientific research in all branches of geography and geophysics, except geology. (Since 1945, the 25th anniversary of the Arctic Scientific Research Institute, the geological section was re-established for research and study of general geology, geomorphology and glaciology.)

While primarily a scientific research institute it also trains technicians (mostly university students) for instrument and observation work. Research work is done by graduate students from the hydrographic institutes of universities.

30. All scientific information collected and disseminated by the coastal and automatic stations, by inland posts, by expeditions, field parties, icebreakers, etc, goes to the Arctic Scientific Research Institute for analysis, evaluation integration, summation and recording. Daily meteorological observations are reported to GUGMS in Moscow three times a day for weather forecasts. Every year the Arctic Scientific Research Institute sends a committee to inspect all hydrometeorological stations, to consult with their scientists and to check its own geophysical works. Both the Hydrometeorological Service (GUGMS) and the State Oceanographic Institute consult with and advise the Arctic Scientific Research Institute concerning scientific matters. The first Deputy of the institute is in charge of the Geophysical Section responsible for work dealing with meteorology, aeronautics, and magnetics, and of the Marine Section responsible for hydrological, geodetic, sea and river ice research, fishing, hunting, etc. The second Deputy controls the general administrative and political

Sections of the institute. Typical of this as well as of other institutes is the Publications Section. Much of the information acquired by the institute is secret, but some descriptive accounts of expeditions are written in such a way that dissemination need not be restricted. Unclassified materials are then published in the leading journals of their subject fields. They are available to Soviet scientists, but not always to foreign subscribers. The most important periodicals dealing with geography, geophysics, and geology are TRUDY (reports) published by Glavsevmorput¹ as well as by the Academy of Sciences and by the All-Union Geographic Society and its regional branches. The Arctic Scientific Research Institute has a large science library with an excellent collection pertaining not only to geography and geophysics, but to arctic and antarctic regions in general, including extensive representation of foreign scientific literature. In every section or branch where research is conducted there is a good library on subjects pertaining to the special sphere of interest.

1. The Hydrographic Institute and the Arctic Scientific Research Institute are the only two scientific establishments under the jurisdiction of the GUGSR.

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